

METHODS AND SYSTEMS FOR DSP-BASED RECEIVERS

ABSTRACT OF THE DISCLOSURE

Digital signal processing based methods and systems for receiving data signals include parallel receivers, multi-channel receivers, timing recovery schemes, and, without limitation, equalization schemes. The present invention is implemented as a multi-path parallel receiver in which an analog-to-digital converter (“ADC”) and/or a digital signal processor (“DSP”) are implemented with parallel paths that operate at lower rates than the received data signal. In an embodiment, a parallel DSP-based receiver in accordance with the invention includes a separate timing recovery loop for each ADC path. The separate timing recovery loops can be used to compensate for timing phase errors in the clock generation circuit that are different for each path. In an embodiment, a parallel DSP-based receiver includes a separate automatic gain control (AGC) loop for each ADC path. The separate AGC loops can be used to compensate for gain errors on a path-by-path basis. In an embodiment, a parallel DSP-based receiver includes a separate offset compensation loop for each ADC path. The separate offset compensation loops can be used to independently compensate for offsets that are different for each path. In an embodiment the present invention is implemented as a multi-channel receiver that receives a plurality of data signals. In an embodiment, one or more of the following types of equalization are performed, alone and/or in various combinations with one another: Viterbi equalization; feed-forward equalization (“FFE”); and/or decision feed-back equalization (“DFE”).